

We claim:-

1. An aqueous polymer dispersion based on copolymers of  
5 vinylaromatics and butadiene, which is obtainable by free radical copolymerization of
  - (a) from 0.1 to 99.9% by weight of styrene and/or methylstyrene,
  - 10 (b) 0.1-99.9% by weight of 1,3-butadiene and/or isoprene and
  - (c) from 0 to 40% by weight of other ethylenically unsaturated copolymerizable monomers, the sum of the monomers (a), (b) and (c) always being 100%,
- 15 in the presence of from 10 to 40% by weight, based on the monomers used, of at least one degraded starch having a molecular weight Mn of from 500 to 40 000 and of water-soluble redox catalysts, the redox catalyst used being  
20 a combination of hydrogen peroxide and at least one heavy metal salt from the series consisting of the cerium, manganese and iron(II) salts.
2. An aqueous polymer dispersion as claimed in claim 1, wherein a mixture of (a) styrene and (b) 1,3-butadiene is used in the  
25 copolymerization.
3. An aqueous polymer dispersion as claimed in either of claims 1 and 2, which has a solids content of from 10 to 50%.
- 30 4. An aqueous polymer dispersion as claimed in any of claims 1 to 3, wherein the copolymers have a particle size of from 40 nm to 2  $\mu$ m.
5. A process for the preparation of aqueous copolymer  
35 dispersions based on vinylaromatics and butadiene by copolymerization of vinylaromatics and butadiene in an aqueous medium in the presence of starch and water-soluble redox catalysts, wherein
  - 40 (a) from 0.1 to 99.9% by weight of styrene and/or methylstyrene,
  - (b) 0.1-99.9% by weight of 1,3-butadiene and/or isoprene and
  - (c) from 0 to 40% by weight of other ethylenically unsaturated copolymerizable monomers
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- are used in the copolymerization, the sum of the monomers (a), (b) and (c) always being 100, the copolymerization being carried out in the presence of from 10 to 40% by weight, ~~based on the monomers used, of at least one degraded starch~~
- 5 having a molecular weight  $M_n$  of from 500 to 40 000 and the redox catalyst used being a combination of hydrogen peroxide and at least one heavy metal salt from the series consisting of the cerium, manganese and iron(II) salts.
- 10 6. A process as claimed in claim 5, wherein a monomer mixture comprising
- (a) from 50 to 99% by weight of styrene and/or methylstyrene,  
(b) from 1 to 50% by weight of butadiene and/or isoprene and  
15 (c) from 0 to 40% by weight of other ethylenically unsaturated copolymerizable monomers
- is in an aqueous solution of an enzymatically degraded natural starch with a redox catalyst comprising hydrogen  
20 peroxide and heavy metal ions from the group consisting of the cerium, manganese and iron(II) salts.
7. A process as claimed in claim 5 or 6, wherein the copolymerization is carried out in the presence of a  
25 complexing agent for iron in concentrations from 1 to 5 mol per mole of iron salt.
8. The use of an aqueous polymer dispersion as claimed in any of claims 1 to 4 as an engine size and/or surface size for  
30 paper, board and cardboard.

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